

UNITED STATES PATENT OFFICE.

JOSEPH A. WILLIAMS, OF CLEVELAND, OHIO, ASSIGNOR TO THE K-W IGNITION COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CIRCUIT-BREAKER FOR IGNITION SYSTEMS.

1,231,681.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH A. WILLIAMS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Circuit-Breakers for Ignition Systems, of which the following is a full, clear, and exact description.

This invention relates to circuit breakers or timers for ignition systems adapted to be employed in connection with internal combustion engines, and has for its chief object to provide a circuit breaker which is adapted particularly for use with so-called battery ignition systems wherein a battery is used alone or in conjunction with a generator for supplying igniting current.

More specifically considered, the invention aims to provide a circuit breaker wherein the contacts by which the primary circuit is made and broken will be in contact substantially the same period of time for all speeds of operation. A still further object is to provide a circuit breaker construction such that the contacts cannot be left in engagement when the engine comes to rest.

The invention may be briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheet of drawings, Figure 1 is a face view of the main parts of the circuit breaker embodying my invention with the contacts separated and the circuit open; Fig. 2 is a similar view of the cam and the contact members with the contacts still separated and about to engage to close the circuit; and Fig. 3 is a similar view with the contacts in engagement.

In the accompanying sheet of drawings 10 represents the operating shaft which drives a cam 11 which is in the form here shown and is designed for a four-cylinder engine. This shaft may be journaled on a suitable plate 13 which supports the contacts and the springs and levers employed in conjunction therewith. The distributor shaft 50 may be coupled to the end of shaft 10, in which event the circuit breaker and distributor,—the latter not being shown,—may be combined into one unit. In that case the plate 13 will constitute a part of the casing or may be inclosed in the casing in-

dependently thereof. It will be observed that the cam 11 is provided with peripheral cam portions 14 similar to ratchet teeth, the ends of which may be, and preferably are, undercut, as shown. It will be observed also that from the base of one tooth to the point of the adjacent tooth the surface or periphery of the member 11 extends with a spiral or cam taper, forming four distinct cams or cam portions. Of course, the number of such cam portions will depend on the number of cylinders of the engine with which the device is used.

Pivoted to the plate 13 by means of a screw or equivalent pivoting device 15 is a contact lever 16 provided with a lug 17 which is adapted to be engaged by the teeth or cam projections at the periphery of the cam 11. This lever carries at its free end a contact or contact point 18 and is normally pressed toward or against a suitable stop pin or lug 19 by means of a relatively stiff spring 20, here shown as a leaf spring, one end of which is attached to the lever 16 and the other of which is attached to a pin 21 on the plate 13. Coöperating with this lever is a second lever 22 which is pivoted on a screw 23 and is likewise urged or pressed downwardly or in the same direction that the lever 16 is pressed, by a spring 24 which is relatively weak, that is to say, is weaker than the spring 20. This lever 22 is provided with a U-shaped bend forming two substantially parallel portions, the upper portion being provided with an insulated abutment 25 and the lower portion with the second circuit breaker contact 26. Between the abutment and contact 26 is located the free end of the lever 16, the contact 18 carried thereby being directly opposite and in position to engage the contact 26. The abutment 25 is preferably adjustable and in this case is mounted in an adjustable screw 27 carried by the lever 22. By means of this adjustable screw the distance between the abutment and contact 26 can be adjusted at will.

It will be understood that the two contacts 18 and 26 are in the primary circuit of the ignition system, and hence that the two levers 16 and 22 will be suitably insulated from each other, the electrical connections being made at any suitable point with the two levers. Preferably, lever 22 is pivotally supported on a small block 28 of